

Weather Note

SQUALL LINE PASSAGE AT BARROW, ALASKA, JUNE 21, 1960

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On the evening of June 21, 1960 a squall line, evidenced by a single roll cloud, passed over Barrow, Alaska. Selected photographs of the cloud are reproduced in figure 1. This is an unusual formation at this latitude ($71^{\circ}18' \text{ N.}$) at any time, but especially unusual for so early in the summer season.

During the afternoon of the 21st the cloud cover over Barrow had increased steadily. The pressure was relatively steady until noon when it began to fall slowly. The temperature began to drop at the same time. By observation time at 2053 AST, Barrow was reporting broken clouds at an estimated 1,500 ft., with an overcast estimated

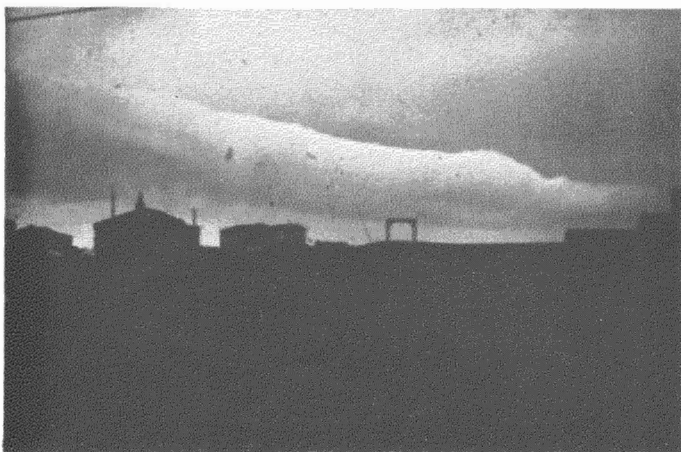
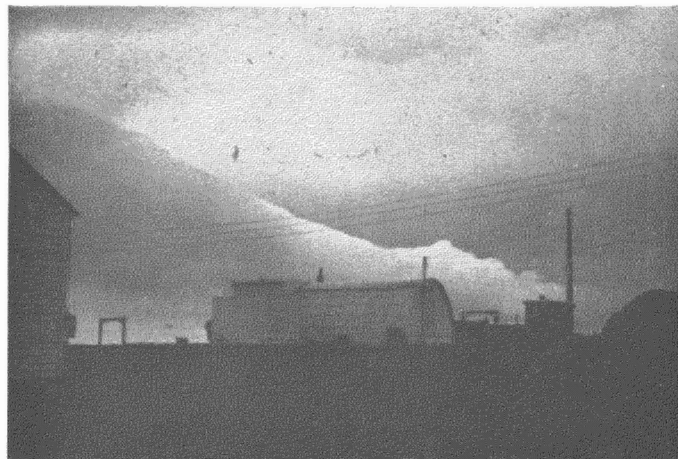


FIGURE 1.--Photographs of the squall line cloud as it passed over Barrow, Alaska, June 21, 1960.

WBAN 10A
Formerly WB Form 1130A also
(Rev. 1-1-55)

U S DEPARTMENT OF COMMERCE, WEATHER BUREAU

SURFACE WEATHER OBSERVATIONS

STATION BARROW, ALASKADATE JUN 21 1960

TYPE 1	TIME (LST) 2	SKY and CEILING (Hundreds of Feet) 3	VISIBILITY (Miles) 4	WEATHER and OBSTRUCTIONS TO VISION 5	SEA LEVEL PRESS. (mbs.) 6	TEMP (°F) 7	DEW PT. (°F) 8	WIND DIREC- TION 9	SPEED (kts) 10	CHAR- ACTER AND SHIFTS 11	ALTIM- ETER SET (ins) 12	REMARKS AND SUPPLEMENTAL CODED DATA 13	14A	14B	OBSER- VERS INITIALS 15
R	1953	E15⊕80⊕	15		135	40	37	←←	8		991	715 1570 48			RM
R	2053	E15⊕80⊕	7	RW-	129	38	36	←←	10		989	RB10			RM
R	2153	E20⊕	7	RW--	132	43	39	←	10		990	SQAL LINE PASSAGE 0720Z PRES RISE 0.07			NN
R	2256	E20⊕40⊕	5	RW-	122	43	39	←	8		987	814 15XX			VL
R	2356	E20⊕	10		108	43	39	←←	14		983	RE 41			VL

STATION BARROW, ALASKADATE JUN 22 1960

TYPE 1	TIME (LST) 2	SKY and CEILING (Hundreds of Feet) 3	VISIBILITY (Miles) 4	WEATHER and OBSTRUCTIONS TO VISION 5	SEA LEVEL PRESS. (mbs.) 6	TEMP (°F) 7	DEW PT. (°F) 8	WIND DIREC- TION 9	SPEED (kts) 10	CHAR- ACTER AND SHIFTS 11	ALTIM- ETER SET (ins) 12	REMARKS AND SUPPLEMENTAL CODED DATA 13	14A	14B	OBSER- VERS INITIALS 15
R	0056	E20⊕80⊕	10		108	41	37	←	10		983				VL
R	0153	E20⊕80⊕	15+		112	40	38	↑	12+20		984	PRESRR SQAL LINE PASSAGE 1145Z PRES RISE 0.04. No MARKED WEATHER DEVELOPMENT. 51001 1570 37			JWA
R	0253	E20⊕80⊕	15+		108	41	37	↑↑	10		983	RADAT 81771066 1137Z			NN

FIGURE 2.—Section of the hourly observations sheet for the period covering the squall line passage.

at 8,000 ft. Visibility was 7 miles in light rain showers, temperature 38° F., wind east-southeast at 10 kt., and pressure 29.890 in.

Just after this observation the roll cloud was seen approaching Barrow from the southwest. Mrs. McCue was the first to notice it and soon the whole community was out watching it pass overhead under the existing overcast. This single roll cloud at about 800 ft. moved across the sky from southwest to northeast. A gust of wind from the southwest accompanied the cloud and wet clothes hanging on the lines flapped up to horizontal positions. Since this was Midsummer Day there was plenty of light at this hour for picture taking.

A pressure rise of 0.07 in. occurred with the squall line passage. By the 2153 observation the low cloud layer had spread to cover 10-tenths of the sky at an estimated 2,000 ft.; visibility was 7 miles with very light showers; temperature 43° F.; wind southeast at 10 kt.; and pressure 29.895 in. Note the 5° jump in temperature in the hour. The hourly observations are reproduced in figure 2.

The synoptic situation on June 21 and 22 in the region of Barrow is illustrated by surface (fig. 3) and 850-mb.

(fig. 4) maps. A large low pressure system centered over the Arctic Ocean 600–700 miles west-northwest of Barrow was the controlling circulation feature. The cloud formation was associated with a well-defined trough, oriented from west-northwest to east-southeast, which moved northeastward and northward across northwestern Alaska in the controlling flow around the large low pressure system. The surface trough line, in the vicinity of Kotzebue at 1400 AST, moved northeastward and was approaching Wainwright (located 75 miles southwest of Barrow) at 2000 AST. By 0200 AST, June 22, the trough had passed Barrow and Fletcher's Ice Island T-3 (about 70 miles northwest of Barrow), which reported a thunderstorm and measured 0.31 in. of precipitation during the 6-hour period. The trough was well-defined at 850 mb. also, extending on a northwest-southeast line over St. Lawrence Island at 0200 AST, June 21, and approaching Kotzebue at 1400 AST; the trough was much less well-defined at 0200 AST, June 22.

Only four thunderstorms have been recorded at Barrow in 40 years. The most recent one before the 1960 occurrence was on July 1, 1957.

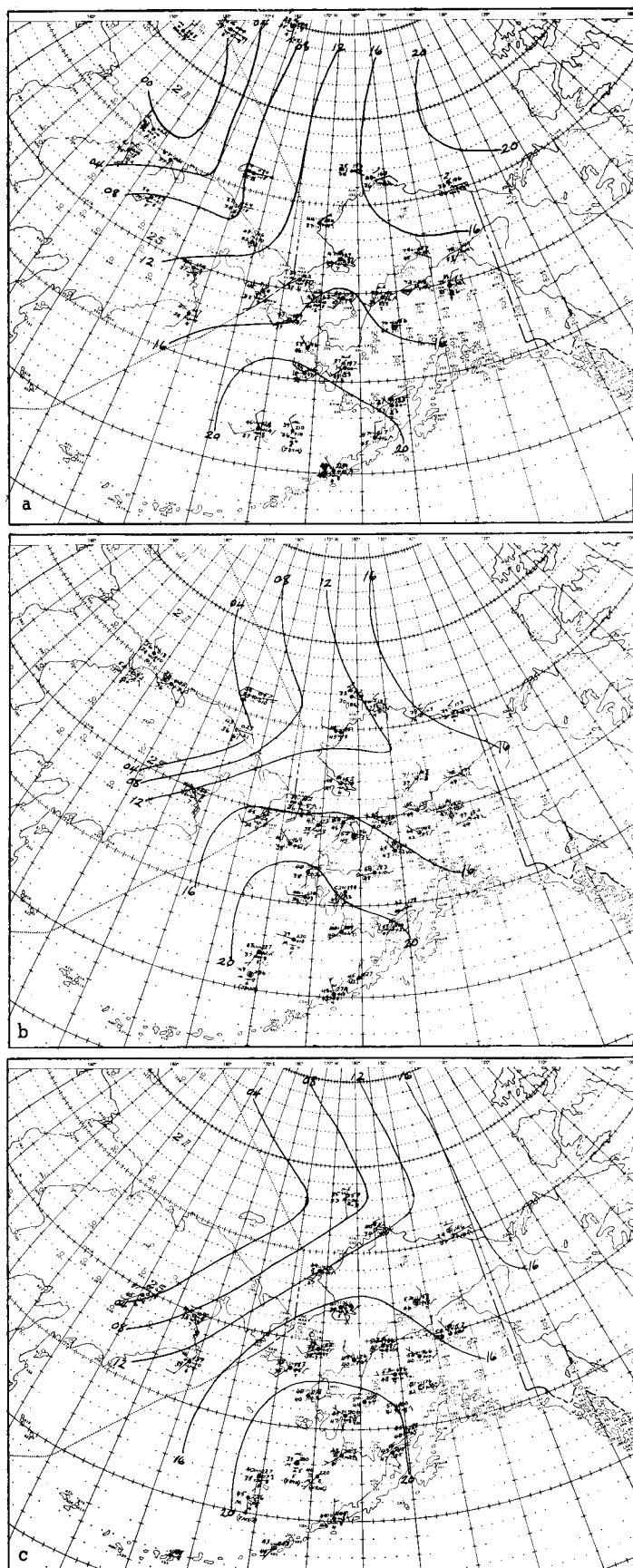


FIGURE 3.—Surface maps for (A) 0000 GMT, (B) 0600 GMT, and (C) 1200 GMT, June 22, 1960. The squall line passage occurred at 0720 GMT, June 22 (2120 AST, June 21).

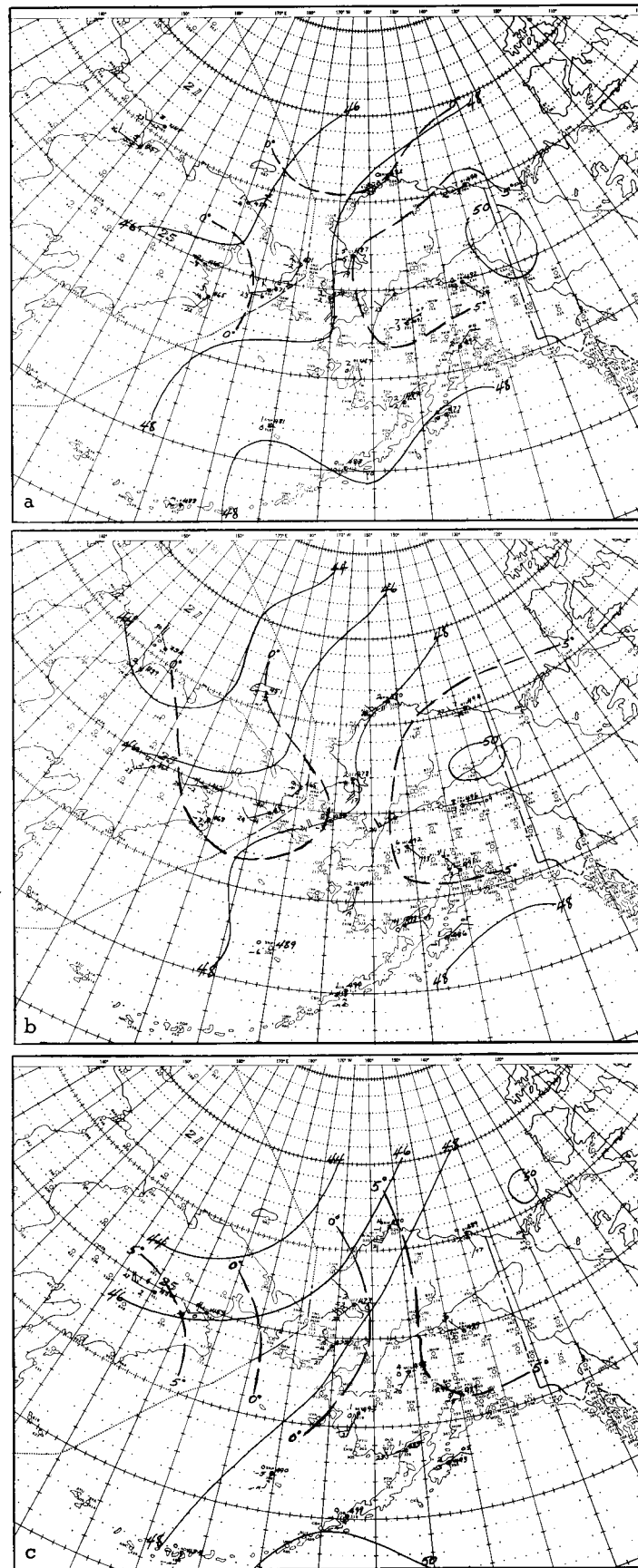


FIGURE 4.—850-mb. maps for (A) 1200 GMT June 21, (B) 0000 GMT, and (C) 1200 GMT June 22, 1960.